

Manufacturing Extension Partnership Of Utah



Introduction to Green Enterprise Development



Manufacturing
Extension
Partnership

Copyright © 2009 Manufacturing Extension Partnership of Utah



The **key** to reducing energy costs is reducing **waste**!

What is **waste**? “Anything other than the **minimum** amount of **equipment**, **materials**, **parts**, **space**, and **worker’s time** which are absolutely necessary to **add value** to the product”.

Shoichiro Toyoda, President , Toyota



Manufacturing
Extension
Partnership

Copyright © 2009 Manufacturing Extension Partnership of Utah



Currently:

- Energy is typically 3% of product cost
- 32% of Fortune 100 companies would de-select a supplier for not maintaining green sustainability
- 5 years it is estimated this will rise to over 70%
- Consumers are increasingly using 'green' as a primary product selection criteria



Manufacturing
Extension
Partnership

Copyright © 2009 Manufacturing Extension Partnership of Utah



Going Green Requires Energy Management System:

- Leadership commitment
- Written energy policy
 - Standards
 - Objectives for continuous improvement
- Baseline metrics
- Total employee involvement
- Sustainability



Where do you begin?

**We don't know how to get where we want to go
until we know where we are!**



Copyright © 2009 Manufacturing Extension Partnership of Utah



***Lean to Green* - Assessment follows two tracks:**

1. Baseline Assets

- Energy Management Policy and Deployment
- Utilities, HVAC, Lighting, Controls, Accounting

2. Primary Process Assets

- Defects, Overproduction, Waiting, NVA, Transportation, Inventory, Employee K,S,As
- Plant layout, Right Sized Equipment, Leaks, Discharges, Materials
- Waste, recycling



Manufacturing
Extension
Partnership

Copyright © 2009 Manufacturing Extension Partnership of Utah



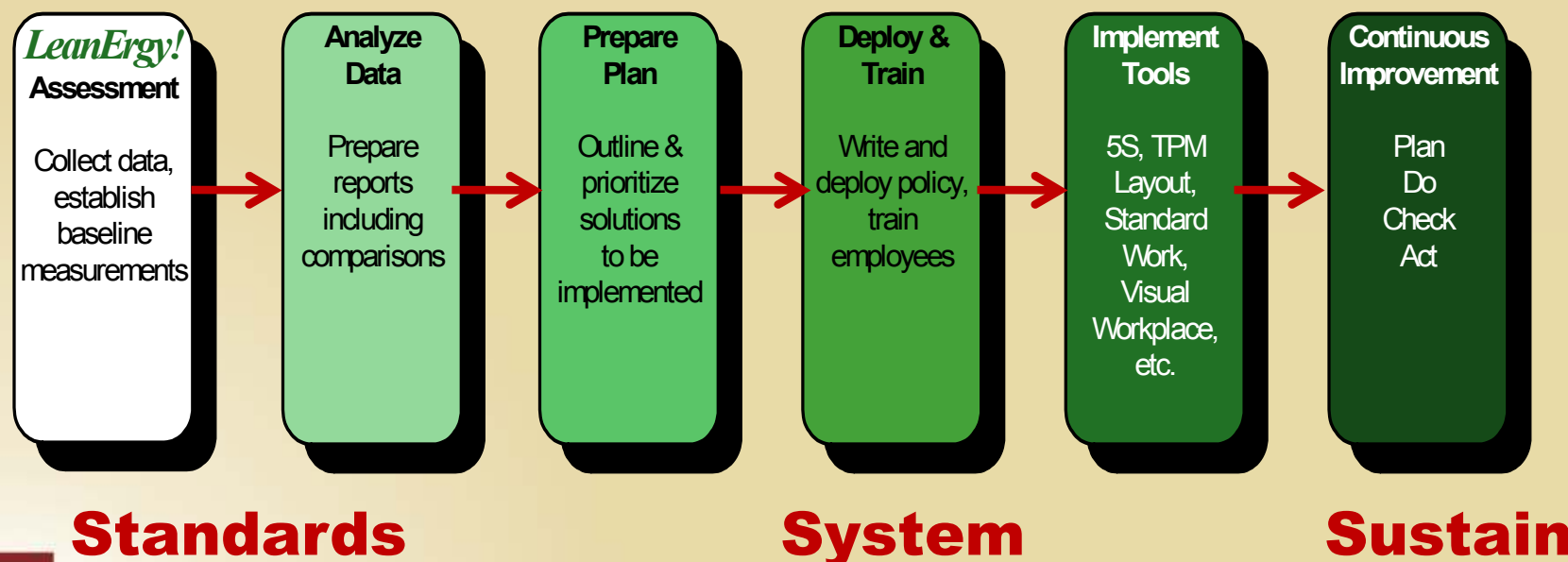
Baseline Asset Review

Data required:

- Utility costs and volume
 - Consumption charges
 - Demand charges
 - Power Factor
- Lighting survey
- Energy systems in use
- HVAC survey



The *Lean to Green* Assessment Process:



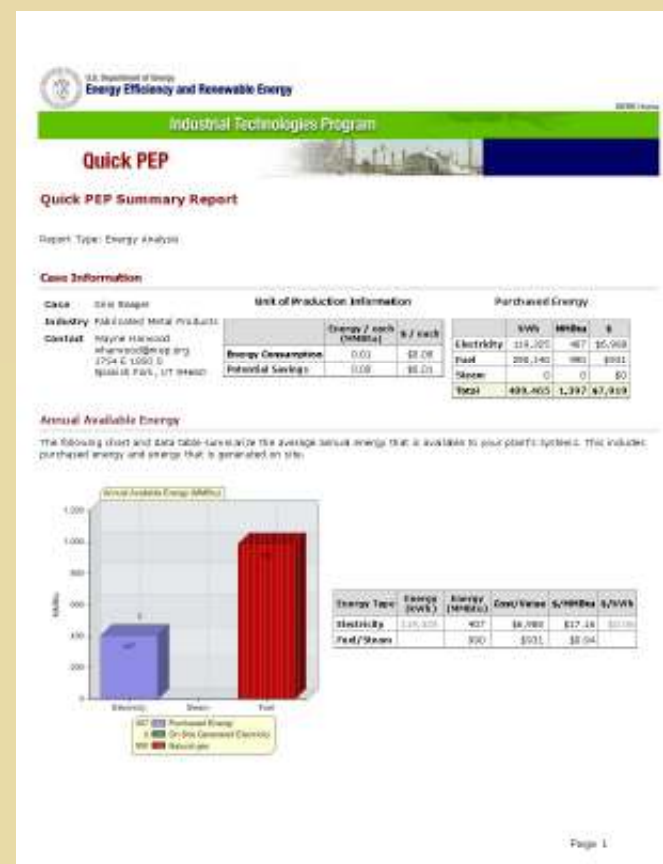


Results will include:

- Industry comparison and cost analysis of current energy use
- Action item list of recommendations
- Rebates and improvement funding opportunities
- List of specific issue experts for upgrading systems



Manufacturing
Extension
Partnership



Green Enterprise Development

- Level - 1 Green Generalist Training
 - Green 101 - One-day workshop combines classroom-style learning with an interactive “live” simulation. Participants learn green concepts, key environmental issues facing manufacturers, and the components of sustainability. **Appropriate for the entire workforce.**

Green Enterprise Development

- Level 2 – Green Specialist Series
 - One-day workshop for each of the six modules with simulations and case studies for in-depth instruction in applying green concepts and techniques.
 - Find better ways to measure environmental progress and how to impact your bottom line.
 - Appropriate for plant engineers, industrial engineers, manufacturing engineers, design engineers, level 1 procurement specialists, environmental managers, and green team participants.



Manufacturing
Extension
Partnership

Green Enterprise Development

- **Putting Sustainability in Practice** - Develop the business case for implementing a comprehensive environmental management or sustainability program. Topics include regulations and permitting, certifications and marketing, supply-chain methods, and ways to measure a successful program.
- **Dumpster Dive** - Learn fundamentals of solid waste streams and their sources by focusing on the leading methods of waste reduction, known as the 4Rs - Refuse, Reduce, Reuse, Recycle. Activities and sessions on lifecycle analysis, alternative material selection, byproduct reduction, waste exchange, and zero landfill.
- **Energy Management** - Learn how to manage energy usage and invest in energy efficiency to cut energy costs and reduce carbon footprint. Renewable energy sources and basic energy-use alternatives are discussed.
- **Green Chemistry** - Hands-on activities focus on how to apply green chemistry principles and techniques throughout the business — from cleaning to machining — to better manage chemical use and chemical waste.
- **Pollution Solutions** - Program will provide innovative methods to improve emission control and environmental management systems, and new technologies to reduce air pollution.
- **H2O Conserve** - Interactive exercises introduce lower-cost and conservation principles and practices in operation and design of water systems.

Green Enterprise Development

- Green Specialist Certificate
 - 56 Hours of classroom instruction with hands on simulations
 - With Accreditation from SME
 - Participants must pass the Green Certificate Exam.
 - Prerequisites include:
 - Completing all six modules of Green Specialist Series, or
 - Completing the three-day Green Specialist Certificate Preparation workshop

Green Enterprise Development

- Level 3 – Green Champion Certificate
 - To earn the Green Champion Certificate, participants must pass Green Certificate Exam first, then complete and document **champion project**.
 - Green Champion Projects can focus on documented waste reduction or elimination efforts related to solid waste generated, energy usage, water usage, wastewater discharge, air emissions, chemical wastes or other areas where the benefits for the company can be measured.



Manufacturing
Extension
Partnership

L-3 Communications 2009

■ What kind of results are we seeing?

- Clean Air Vehicle Parking spaces; 35
- Reduced paper use = 400,000 sheets
- Fleet CO2 reduction = 25,000 lbs.
- Work from Home: CO2 reduction of = 123.6 tons
- Office Supplies: Employees encouraged to buy supplies featuring “post consumer” materials – 21.53% of orders
- Metals (Steel, Tin, Aluminum, Copper, Brass): 70.62 tons
- Paper Recycled: 134.68 tons
- Cardboard (Baling): 38.71 tons
- SSR Compactor: 39.45 tons



Primary Process Asset Savings

Examples:

Typical electric motor costs - \$62/hp/shift/year

Upgrading to an energy efficient motor can result in savings of about 5% or \$3.15/hp/shift/year

Compressed air leaks (15psi) = \$30-\$90/leak/shift/year

For every 2 psi reduction in compressor discharge pressure there is a 1% savings in power (92 psi is max level for efficiency)

Reducing air pressure 10psi = 5% reduction in energy consumption

Cost savings for demand reduction (load shifting)

Move operating shift to off-peak times: \$75/hp/yr

Move 'other electric equipment' to off peak: \$120/kW/yr

Source: The Lean Energy Toolkit, Environmental Protection Agency, p 44,45)



Manufacturing
Extension
Partnership

Copyright © 2009 Manufacturing Extension Partnership of Utah



THE BOTTOM LINE?

Companies have to be profitable! Energy is simply a commodity that needs to be managed to drive the highest possible profit.

Most companies that go Green will see and 8 to 1 ROI.



Questions?

Thank You!



Manufacturing
Extension
Partnership

Copyright © 2009 Manufacturing Extension Partnership of Utah